

UCRL-JC-123285 Abs
Abstract submitted to the
**11th Topical Conference on
High Temperature Plasma Diagnostics**
Monterey, California
May 12-16, 1996

Topic: X-ray imaging

X-ray backlit imaging to measure the in-flight pusher density of an indirect drive capsule implosion core*

D.H. Kalantar, B.A. Hammel, O.L. Landen, C.J. Keane, and D.H. Munro - *Lawrence Livermore National Laboratory* - Both the efficiency of an implosion and the growth rate of hydrodynamic instability increase with the aspect ratio of an implosion. In order to study the physics of implosions with high Rayleigh-Taylor growth factors, we use doped ablators which should minimize x-ray preheat and shell decompression, and hence increase in-flight aspect ratio. We present x-ray backlit images¹ of indirectly-driven capsules for measuring such in-flight aspect ratios for doped ablators. Backlit 4.7 keV images of the full capsule are recorded throughout the implosion phase with 80 ps and 15 μm resolution. We inferred the radial density profile as a function of time by Abel inverting the x-ray transmission profiles. We will compare measurements of the in-flight density using a Ge-doped ablator with results from an undoped ablator.

¹ M. Katayama *et al*, Rev. Sci. Instrum. **64**, 706 (1993).

* Work was performed under the auspices of the U.S. Department of Energy by the Lawrence Livermore National Laboratory under Contract No. W-7405-ENG-48.

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